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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/193,032 11/16/98 RENNEKE R 30-4012

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ALLIEDSIGNAL
LAW DEPARTMENT- M/S 36-2-76000
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EXAMINER

STRICKLAND, J

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 03/22/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/193,032

Applicant(s)

Renneke et al.

Examiner

Strickland, Jonas

Group Art Unit

1754



☒ Responsive to communication(s) filed on Mar 8, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle* 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-20 is/are pending in the applicat

Of the above, claim(s) 18-20 is/are withdrawn from consideration

☐ Claim(s) is/are allowed.

☒ Claim(s) 1-17 is/are rejected.

☐ Claim(s) is/are objected to.

☐ Claims are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number)

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received:

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2 and 3

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of Invention I, claims 1-17 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that Inventions I and II are related such that a proper search of the claims may be conducted simultaneously and that undue burden on the Examiner is outweighed by the public interest in having all of the issued patent claims covering Applicants' invention. This is not found persuasive because Applicant has failed to show how the apparatus claimed can be used in another materially different process other than removing NO_x gases. Examiner has made known to Applicant that the absorbent claimed may be used in the catalytic removal of ozone, hydrocarbons and carbon monoxide from air. Since Applicant has not overcome the distinction between the two inventions, Invention I and Invention II, the requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 6, 8, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6, line 1 recites the limitation "the support particles" in line 1. There is insufficient antecedent basis for this limitation in the claim. Applicant recites "support" in claim 1, line 2 and not "the support particles". It is suggested that Applicant recite --support--.

Claim 8 recites "a first group of particles is made of the support, ... the alkali material is on a second group of particles". It is not clear as to whether the particles are the support or if the particles are used to make the support. Furthermore, it is not clear if the particles are alkali material or if the particles are different from the alkali material. This claim is indefinite.

Claim 12 recites the limitation "the support" in line 1. There is insufficient antecedent basis for this limitation in the claim. It is suggested that Applicant recite --the support particles--.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5 and 7-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. (EP 0 625 368) in view of Zensuke (JP 07 000743).

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Applicant claims NO_x removal apparatus comprising a support made of a mixture including manganese dioxide and copper oxide; and an alkali material combined with the support; the support and the alkali material being combined for NO_x removal. Applicant further claims that the alkali material is potassium carbonate. The gas having a temperature below 100°C during the NO_x removal, this is deemed as failing to limit the apparatus structure.

Shimada et al discloses a process for cleaning a harmful gas at an ordinary temperature and thus effects excellent cleaning on the gas (p.3, lines 13-14). The cleaning agent used to remove the harmful gas is comprised of an alkali metal compound supported on a metallic oxide. The metallic oxide comprises cupric oxide (copper oxide) and manganese dioxide, which is prepared by impregnating an alkali material (claims 11-12; p. 3, lines 17-18 and lines 53-55). The composition is comprised of 40% by weight of cupric oxide and 60% weight of manganese dioxide. The reference also goes on to teach that it contains about 30% or less by weight of oxide of potassium or potassium carbonate (claims 14-16, p. 3, lines 37-41). The temperature of contact between the cleaning agent and the harmful gas is about 0 to 100°C, but it is usually room temperature 10 to 50°C (p. 3, lines 57-58). However, Shimada et al does not teach a mixture including a chromium oxide with respect to claim 13.

Zensuke teaches an adsorbent excellent in the adsorption of nitrogen oxide, particularly at low temperature by carrying copper, a metal oxide of manganese and chromium, and a carbonate. The component ratio of the carbonate to the alkali metal to the carrier is 5-30 weight %.

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It would have been more than obvious based on the teachings of Zensuke to include chromium oxide into a mixture having manganese oxide and copper oxide and an alkali metal compound as taught by Shimada et al. Furthermore, the Zensuke reference teaches carrying this reaction at a low temperature. In reference to claims 1-10, the Shimada et al does not disclose using the adsorbent for the removal of NO_x gases, but for the removal of harmful gases. Examiner holds that NO_x gases are harmful, however and the Zensuke et al reference teaches using an adsorbent comprised of copper oxide, manganese dioxide, chromium oxide, and carbonate at low temperatures. Furthermore with respect to claims 8-10, the Shimada et al reference does not teach a first and second vessel and an enclosure for providing gas, but Shimada teaches an impregnation method used to mix the support particles and the alkali metal. Applicant recites within the specification p 4, lines 18-19 that the alkali metal may be combined with the support in many ways. Examiner holds that it is more than obvious to use two separate vessels and an enclosure to combine the support particles and the alkali metal. Zensuke does not give a specific temperature range for the NO_x removal, but the Examiner holds that the reference discloses the desire for the removal of NO_x gases at low temperatures such as for temperatures below 100°C. In any case, the temperature does not limit the apparatus structure. Furthermore, the Examiner holds that the teachings of Shimada et al in view of Zensuke have the expectation of achieving exceptional results within the art based on their equivalence within the art.

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6. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al (EP 0625368 A) in view of Zensuke (JP 07 000743) as applied to claims 1-5 and 7-16 above, and further in view of Ichiki et al (EP 0722763 A1).

Applicant claims, with respect to claims 6 and 17, the support particles have an internal surface area of at least $150 \text{ m}^2/\text{g}$.

The teachings of Shimada et al and Zensuke have been discussed above and they do not teach the surface area of the support area of at least $150 \text{ m}^2/\text{g}$.

Ichiki et al discloses NO_x adsorbents having copper and manganese oxides on a supported carrier for the adsorbing and removing of NO_x gases, wherein the specific surface area of the supported particles of the adsorbent is $40\text{-}200 \text{ m}^2/\text{g}$ (p. 3, lines 22-27).

It would have been obvious to one of ordinary skill at the time of the invention based on the teachings of Ichiki et al to utilize an adsorbent having a specific surface area from $40\text{-}200 \text{ m}^2/\text{g}$ for the adsorbing of NO_x gases. Ichiki et al teaches that an adsorbent having this physical property exhibits thermal resistance and a high adsorbing performance. Although Ichiki et al does not disclose having an alkali metal impregnated into the supported particles (copper and manganese oxides), Examiner holds that the supported particles having the disclosed surface area as taught by Ichiki et al may be impregnated with the alkali metal compounds as taught by Shimada et al. Furthermore, Examiner holds that the teachings of Ichiki et al, Shimada et al, and Zensuke would achieve exceptional results based upon their equivalence in the art of adsorbing harmful gases, such as NO_x gases.

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Conclusion

7. Any inquiry concerning this communication from the examiner should be directed to Jonas N. Strickland at (703)306-5692. The examiner can normally be reached on Monday through Thursday and every other Friday from 7:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin, can be reached at (703)308-1164. The Group 1700 facsimile machine number is (703)305-3599.



J.N. Strickland

March 20, 2000



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3/22/00